This Specification Data Sheet
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CM750

ANALOG & DIGITAL SLM NETWORK ANALYZER

Ensure Reliable Network Operation for Analog and Digital Services

Increase network performance and customer satisfaction by using the CM750 to systematically detect and locate impairments in your analog and digital video services—in real time.

- Continuous measurements reveal changing network conditions
- Integrated Web Browser and PC Emulation option
- Upstream Spectrum with CPD, C/I & C/N measurements
- Comprehensive digital analyzer with constellation and optional equalizer and frequency response displays

JUST ANOTHER WAY
WE'RE UNCOMPLICATING CABLE

SUNRISE TELECOM
BROADBAND

…it's ready to work whenever and wherever your technicians need it.

OVERVIEW

Full analog and digital SLM functions make the CM750 the most comprehensive troubleshooting tool available.

Easy-to-use pass/fail test screens indicate problems quickly, so that adjustments, replacements and follow-up verification tests can be performed immediately. The CM750's in-band capabilities and continuous measurements simplify locating tough intermittent problems.

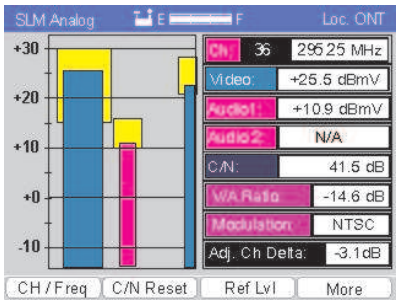
The CM750's rugged construction makes it ready to work whenever and wherever your technicians need it—no need to leave the meter turned on between uses, boot up time is less than 30 seconds. The integrated fan ventilation allows continuous meter operation. The CM750 will operate continuously at up to 120°F ambient and can be used even in the heaviest rain. And when the sun is shining the improved LCD screen affords great screen visibility.

Test anywhere in the network—even use the CM750's optional Browser function to substitute for the customer's PC to troubleshoot in-home wiring, routers, firewalls and hubs. Lighten your workforce's load with the CM750—it's more versatile and easier to carry than a meter and a laptop for field testing. The Web Browser option can allow your technicians to be more efficient by providing access to your workforce management system.

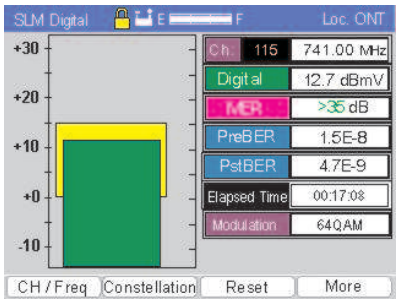
The CM750 provides quick, reliable and repeatable results from manual or automated testing that can be stored or uploaded to a PC or to a server over the network for analysis or integration into back office management systems.

…the one-meter solution for North America and worldwide.

INTEGRATED ANALOG & DIGITAL SLM



SLM Analog Display



SLM Digital Display

CM750 SLM

Accurately measure the level of all common modulated carriers.

- Full analog and digital measurements
- 1 channel and Scan channel display
- C/N Measurement (off channel)
- Auto scan with user programmable pass/fail limits
- System tilt, peak-to-valley, and adjacent channel measurements
- Detail screens with all measurement results or view just the results outside the pass/fail limits

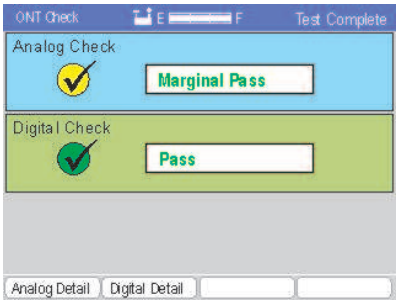
Users may select Single Channel or Scan SLM modes to view a variety of channels. Single Channel mode provides an analog and digital read-out of the channel's level with results outside the pass/fail criteria displayed in red. Analog channels display the video carrier, audio carrier, carrier to noise ratio and adjacent channel's levels. Digital channels display the Average Power Level of the QAM signal and the adjacent channel's level. Scan SLM mode provides a display of the entire channel plan including video and audio carriers and digital signals. It also displays summaries of the measurements, including analog and digital results for minimum and maximum level, tilt and Peak-to-Valley. In addition, worst case video-to-audio ratio, worst case adjacent channel ratio and the average analog to digital power ratio measurements are provided. Detail screens allow views of all of the measurement results or are limited to results outside of the programmed limits criteria.

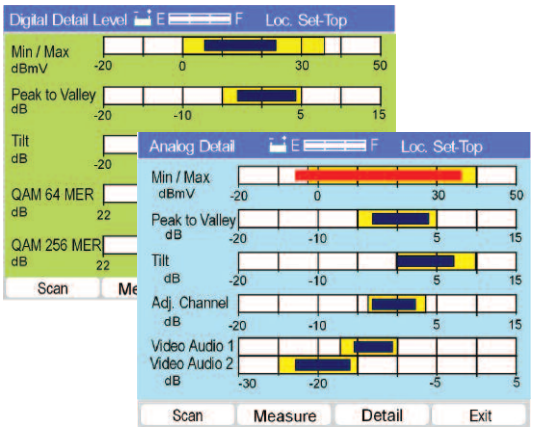
The CM750 provides complete measurement detail for the selected channel and automatically switches between analog and digital operation.

The CM750 provides NTSC and PAL-M analog and Annex B and C digital video analysis for North American and other networks compatible with a 6 MHz channel spacing.

…easily run comprehensive tests, quickly and consistently.

"SMART" ONE-BUTTON TESTS





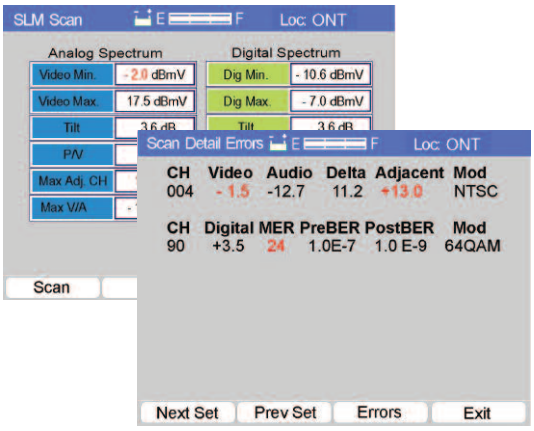
The CM750 includes SMART tests. The administrator programmable tests are used to automatically evaluate network performance and to provide consistent and comprehensive testing. All test results can be saved and uploaded over the network. SMART test setups and instrument configurations can be stored on the network and downloaded to any meter when needed, making configuration changes easy and ensuring consistent testing.

Three SMART test locations are provided, each with its own set of programmable tests and pass/fail limits. SMART tests may include analog and digital level scans (with custom channel plans), digital MER and BER. These one-button tests are a great way to quickly and consistently run a series of tests to ensure that the network is meeting performance requirements and has sufficient safety margins to keep running.

View Simple pass/fail test results, summary screens or complete test details. Drill down into the details as much as necessary or as little as desired.

Summary graphs provide the range of test results and the acceptable passing range on a single easy-to-interpret bar graph. Or view the numeric version of the same data for exact measurement results.

Also drill down to the detail for all measurement data or view just those results that are outside of the measurement limits.



…comprehensive tests assist the technician in systematically identifying and correcting the cause of a failure.

COMPREHENSIVE TESTS

DOWNSTREAM:

- Analog Signal Level
- Digital Signal Level
- Channel Scan
- MER, BER, Constellation
- Downstream Spectrum Analyzer with CC/N
- Optional Equalizer and Frequency Response and Auto Diagnosis

UPSTREAM:

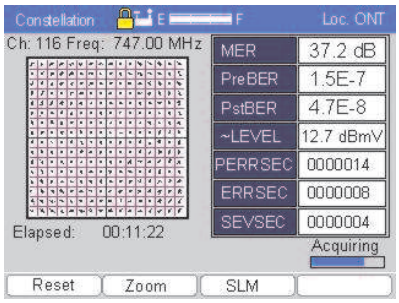
- Spectrum Display with C/N and C/I

NETWORK/PC:

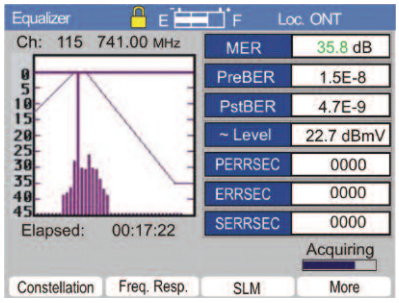
- Substitute emulate PC
- Verify the PC DHCP process
- Optional Web Browser

…constellation display eliminates the guesswork.

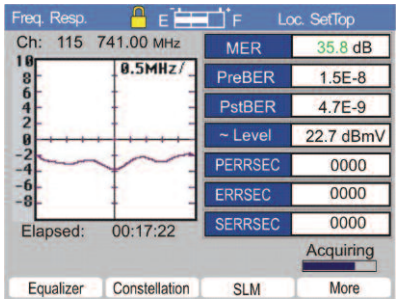
DOWNSTREAM TROUBLESHOOTING



Downstream Screen with Constellation Display



Downstream Screen with Equalizer Display (Optional)



Downstream Screen with Frequency Response Display (Optional)

Display the QAM modulated signal and use the CM750 to identify downstream impairments. Quickly diagnosis and reliably identify impairments such as noise, interference, phase noise, CSO, in-band spurs, laser clipping, and gain problems. Optional Equalizer Stress and Frequency Response screens may be added for complete downstream troubleshooting.

MER

Modulation error ratio provides early detection of non-transient, digital impairments including system noise, CSO, CTB, ingress and modulator problems. The CM750's pass/fail display allows technicians to quickly detect if MER meets recommended system levels for 64 QAM or 256 QAM signals. As the number of subscribers increases, ensuring adequate MER becomes more critical than ever. Poor MER can result in degraded performance, due to excessive packet retransmissions, and resultant customer dissatisfaction. Never risk falling over "the digital cliff;" the CM750 helps you make sure that you have a safe operating margin.

PRE- AND POST-FEC BIT ERROR RATE (BER)

The CM750's BER display is especially useful for tracking down transient problems such as intermittent ingress, node non-linearity and laser clipping. Verify the occurrence of downstream errors with the pre-forward error correction bit error rate (PreBER). Determine if the FEC function is successfully working with the post-FEC BER (PstBER). The display indicates errored seconds for pre- and post-FEC correction. If the errors are not correctable, a Severely Errored Second is displayed—an indicator of poor network performance.

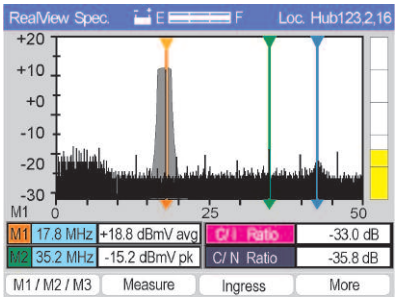
DEEP INTERLEAVE

Some digital video modulators utilize a deep interleave on 256 QAM modulation. The Deep Interleave feature allows the CM750 to make BER measurements on deep interleave (i=4, j=128) digital video signals.

For more information on QAM constellations, MER and BER, go to our online CATV Training page at www.sunrisetelecom.com.

…technicians can detect isolate and repair network issues long before they affect your customers.

UPSTREAM SPECTRUM



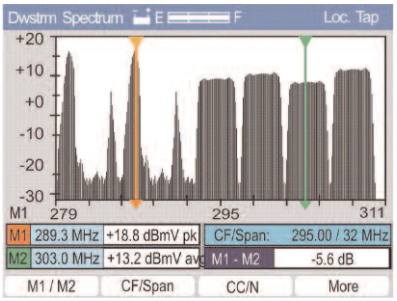
Upstream Spectrum Display

Eliminate slow uploads due to return path ingress, noise and CPD. The Upstream Spectrum feature offers the simplest automated method for testing and troubleshooting the return path. Use the CM750 to measure bursty TDMA return signals, intermittent ingress, noise and CPD (common path distortion). Simply set the markers and the CM750 does all the work, reading out the carrier level of TDMA signals, CPD or ingress, C/I ratio and C/N ratio.

Your technicians know the return path is often the most demanding portion of the network. Let the CM750 simplify their job with the simplest, automated return path test and troubleshooting process in the field. Set the markers and let the CM750 provide a simple pass/fail indication or use it to troubleshoot any portion of the return path.

An Ingress screen displays the ingress level, noise level and margin between these and the programmed pass/fail limits. Markers are preprogrammed, but may be repositioned by the user.

DOWNSTREAM SPECTRUM



Downstream Spectrum Display

The downstream Spectrum Analyzer provides a spectral view of any 64, 32, 16 or 8 MHz span in the 50 to 870 MHz range. View signal, Ingress or Distortions on the network and use the markers to measure analog or digital signals, CC/N (carrier to noise) or C/I (carrier to ingress). Setup allows the user to select the peak detector for analog signals or select the average detector and set the occupied bandwidth for accurate digital level measurements.

…ensure the optimum transmit level, assure an appropriate safety margin, and optimize the path attenuation for maximum ingress reduction.

Flexibility…upgrade your CM750 with firmware options right in the field.

FIRMWARE OPTIONS

Easily download and install firmware upgrades

CM-WB WEB BROWSER

Use the web browser and PC emulation option to test in-home RF and Ethernet wiring, routers, PCs or other components. Demonstrate network operation by accessing external web sites. The web browser may also be used to access employee email or workforce management applications via the network. Use the browser for set-top and cable modem provisioning or to view the modem's diagnostic page. Administrator controls allow unlimited browsing or access to specified URLs only.

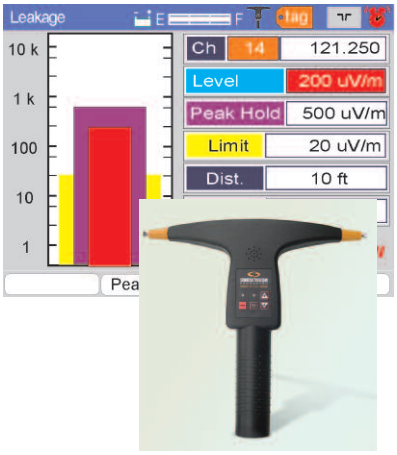
Keep all your meters up-to-date quickly and easily. Download configurations files and even firmware upgrades over your network via the Ethernet port. Select any configuration file to completely set every programmable configuration in your meter. No need to bring a meter back to the office or service center for firmware updates, just download the firmware and install it right in the field—no PC or other tools required.

EXTENDED DIGITAL MEASUREMENTS OPTION

CM-DIG Extended Digital Measurements includes the Adaptive Equalizer display and Frequency Response display in the SLM mode for Digital Measurements. See Downstream Troubleshooting for details.

Flexibility…tailor the CM750 to your specific needs.

HARDWARE OPTIONS



Receive leakage data directly on your CM750

CM-W LP100 LEAKAGE PROFILER OPTION

The LP100 Leakage Profiler is the simplest, most comprehensive leakage location and measurement solution on the market. The LP100 employs a wireless link so problems with tangled cable are avoided. Monitor and locate signal leakage and perform FCC required leakage measurements at the drop—or any network location—save the results, along with other measurements, and upload them over the network.

The LP100 Leakage Profiler provides a calibrated dipole antenna required for FCC measurements and a calibrated collapsed dipole for safely working indoors or on congested sidewalks. Operation of the LP100 Leakage Profiler requires a CM750 equipped with the CM-W wireless interface option. Order the LP100 Leakage Profiler separately and use it with any CM-W equipped CM750.

CM-OE OPTION

CM-OE Optical to Electrical converter is an optional accessory that converts an optical 1550 nm optical signal to RF for testing. Separate AC power (or 12V DC) required.

OPTICAL PARAMETERS:
Wavelength 1280 - 1600 nm
Optical Input Power Range 0 dBm to -8 dBm (30 to 16 dBmV output)
Return Loss >60 dB with APC type connector
Optical Connector SC/APC standard, 8 degree APC

ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS:
Dimensions 3" H x 7" D x 1" W (7.62cm x 17.78cm x 2.54cm)
Weight 10 oz. (0.3 kg)
Operating Temperature Range -40 to +70 degrees C
(temperature at the mounting plate)
Powering 12 VDC via Model# OTPN-12V-PIC
DC Ripple < 50 mV
Power Dissipation < 5 W

PC-IP SOFTWARE

Set up user configuration databases and view test results with the PC-IP software

The PC-IP software is a Windows® application used to build CM750 configuration databases and view uploaded test results. PC-IP is compatible with the CM500 and CM1000 Series meters to share database information. One program will interface to all CM series SLMs and is available free from the Internet.

PC-IP allows your technicians to:

- Clone multiple CM750s or other CM series SLM configurations
- Develop channel tables and limit criteria on your PC and upload them to the CM750 or place them on an FTP server for download over the network
- Document test results, save the data and upload it on an FTP server for viewing
- Ensure that all your CM750s and other CM series SLMs have identical configurations and pass/fail limits
- Provide faster and more reliable configuration than setting up each SLM manually

CM750 SPECIFICATIONS

DIGITAL SIGNAL ANALYSIS
Modulation Type Downstream:
64/256 QAM (DVS- 031, ITU-T J.83 Annex B
Lock Range 64 QAM: -15 to +60 dBmV (typical)
Lock Range 256 QAM: -10 to +60 dBmV (typical)
Downstream Modulation Error Ratio (MER):
Range: 21 to 40 dB Accuracy: ±1.0 dB (typical)

DIGITAL SIGNAL LEVEL METER
Accuracy: ±1.0 dB @ 25°C (typical)
Frequency Range: 5–860 MHz

GRAPHIC DISPLAYS
Constellation: I-Q display of 64 or 256 QAM signal
Bit Error Rate
Downstream BER Range: 1.0 x 10-9 to 9.0 x 10-3
Errored Seconds: Numerical count of downstream errored seconds
Downstream FEC Lock: Loss/Lock-indication
Severely Errored Seconds: Numerical count of downstream severely errored seconds
Elapsed Time: hr, min, sec
Upstream BkER: BkER, Lost Packet Count and PING time

PLUG-IN INTERFACES
10/100Base-T Ethernet
75 ohm F81 (field replaceable)
RS232, PC interface port

POWER
Power: Internal NiMH battery pack
Operating Time: 3 hours continuous (typical)
External Power: 120/240 VAC Adapter/Charger
12 VDC vehicle charger
Power Reduction: Auto unit shut down

GENERAL
Display: Reflective color active matrix LCD 320 x 240 viewable in full sun
Operating Temperature Range: -10º–50ºC

Specifications subject to change without notice.

FIELD-PROVEN SOLUTIONS

For detailed information on the CM750 and its options or the name of your local Sunrise representative visit our website at www.sunrisetelecom.com. Or telephone us at 1-800-297-9726 (International calls: 1-514-725-6652).

Sunrise Telecom Broadband is a leader in digital broadband and DOCSIS test instruments for the broadband industry. As part of the Sunrise Telecom family, we leverage the strength of one of the world's largest test and measurement companies to make your job easier. Sunrise Telecom Broadband's field-proven solutions include installation and maintenance instruments, portable headend analyzers and network test systems and software. Our goal is to enable service providers to rapidly deploy television, high-speed Internet, voice and digital video applications.

Based on our core strength in RF testing, we have established a successful track record as a provider of leading edge solutions that incorporate innovative test methods, intuitive user interfaces, and thorough product training. At Sunrise Telecom Broadband, we uncomplicate the engineer's and field technician's day.

JUST ANOTHER WAY WE'RE UNCOMPLICATING CABLE

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ORDERING INFORMATION

CM750
Includes:
Analog & Digital SLM with tuning range: 50-860 MHz, Annex B & C, RF Input F81 75 ohm connector (field replaceable), Serial interface EIA RS-232, Ethernet modem/PC interface, 100-240V battery charger, Quick Start Guide, User's Manual, and Digital Training CD, CE certified.

INCLUDED ACCESSORIES:
PC-IP software, rubber boot, bag, strand hook, RS-232 cable, 100 to 240 V AC charger, manual, training CD-ROM and 12-volt vehicle charger

FIRMWARE OPTIONS

CM-WB	Web Browser
CM-DIG	Extended Digital Analysis including Equalizer Stress and Frequency Response displays

HARDWARE OPTIONS

CM-W	Wireless interface for leakage detection (LP100 required)
CM-DVM	Deep Interleave (4, 128 digital video) Digital Video BER Measurements
CM-OE	Optical to Electrical node for converting optical to RF signals. Separate power supply and optical jumper included.

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